

**ARIZONA WILLOW
CONSERVATION AGREEMENT AND STRATEGY**

APPENDIX E

**ARIZONA WILLOW PROPOSED RULE
(57 FR 54747)**

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AB83

Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for the Plant "*Salix arizonica*" (Arizona willow); with Critical Habitat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The Fish and Wildlife Service (Service) proposes to list the plant *Salix arizonica* (Arizona willow) as an endangered species with critical habitat under the authority of the Endangered Species Act of 1973, as amended (Act). This riparian plant occurs in low numbers and is endemic to the slopes of Mt. Baldy, the highest peak in the White Mountains of Arizona. It is threatened by livestock and wildlife grazing, habitat degradation and loss, and fungal disease. This proposal, if made final, would implement Federal protection provided by the Act for Arizona willow. The Service seeks data and comments from the public on the proposed rule.

DATES: Comments from all interested parties must be received by January 19, 1993. Public hearing requests must be received by January 4, 1993.

ADDRESSES: Comments and materials concerning this proposal should be sent to the Field Supervisor, Ecological Services Field Office, U.S. Fish and Wildlife Service, 3616 W. Thomas, suite 6, Phoenix, Arizona 85019. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Sue Rutman, at the above address (Telephone: 602/379-4720 or FTS 281-4720).

SUPPLEMENTARY INFORMATION:

Background

Dorn (1975) described the species *Salix arizonica* from specimens collected by Granfelt, who recognized them as distinct in 1969 (Galeano-Popp 1988). Arizona willow is a shrub, up to 0.5 meter (1.5 feet) high, with ovate leaves and red stems. Leaves are 1-4.5 centimeters (0.4-1.8 inches) long, 5-22 centimeters (0.2-0.9 inches) wide, with fine-toothed margins. Leaves are rounded or nearly heart-shaped at the base. Although this species is described as shrubby, it exhibits several forms that include scraggly shrub, rounded shrub, prostrate mat, and large hedge or thicket (Galeano-Popp 1988). The factors responsible for these variations are not understood.

Arizona willow is known only from the White Mountains of Arizona on land managed by the Apache-Sitgreaves National Forest (Forest) and the White Mountain Fort Apache Indian Reservation (Reservation). Although intensive surveys have been conducted on both the Forest and Reservation, the species has been located in only 15 drainages. All Arizona willow plants occur in drainages that trend to the north, east, or south. Sometimes, individuals are widely spaced (more than one mile apart), but occasionally plants are clustered.

The species is found at elevations above 2,600 meters (8,500 feet) in wet meadows, stream sides, and cienegas most commonly in or adjacent to perennial water. Plants are less commonly found in meadows adjacent to forest edges or meadows with sparse stands of spruce. Plants are also found in drier sites within the riparian zone (Galeano-Popp 1988). Species associated with Arizona willow include *Salix monticola* (Serviceberry willow), *Salix geyeriana* (Geyer willow), *Salix hebbiana* (Bebb willow), *Picea pungens*

(blue spruce), *Picea engelmannii* (Engelmann spruce), *Potentilla fruticosa* (shrubby cinquefoil), *Potentilla diversifolia* (cinquefoil), *Mimulus rimuloides* (mat monkeyflower), *Deschampsia caespitosa* (tufted hairgrass) and *Carex* species (sedges) (Galeano-Popp 1988).

Although there are no records of the historic distribution of Arizona willow, unoccupied habitat within the known range does exist. The historical range may have extended approximately two miles further to the east and two miles further to the south (Galeano-Popp 1988). Galeano-Popp (U.S. Forest Service, pers. comm., 1991) and Granfelt (Pinetop, AZ, pers. comm., 1991) believe that all potential habitat has been surveyed and all populations located. The relatively small number of individuals, their rarity within the habitat, and the degraded condition of the habitat indicate the species may have been more common in the past.

Federal government actions on this species began with Section 12 of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*), which directed the Secretary of the Smithsonian Institution to prepare a report on those plants considered to be endangered, threatened, or extinct. This report, designated as House document No. 94-51, was presented to Congress on January 9, 1975. Arizona willow was included as "threatened" in the 1975 Smithsonian report.

Arizona willow's status as a very localized endemic discovered in 1969 and described in 1975 prompted the inclusion of the species in Category 1 in the December 15, 1980 Federal Register (42 FR 82480) notice of plants under review for threatened or endangered classification. The designation was based on a small population and the threat of degradation of riparian habitat by livestock usage (Fletcher 1978). Category 1 includes those taxa for which the Service has sufficient information on biological vulnerability and threat(s) to support the appropriateness of proposing to list them as endangered or threatened. The November 23, 1983, supplement to the 1980 notice (48 FR 53640) included Arizona willow as a Category 3C species based on an assessment by Phillips, et al. (1982) that the willow was endemic but locally common with all known populations apparently healthy and reproducing. Category 3C includes those taxa that have proven to be more abundant or widespread than previously supposed and/or those that are not subject to any identifiable threat. If further research or changes in habitat indicate significant decline in any of

these taxa, they may be reevaluated for possible inclusion in Category 1 or 2. Arizona willow was placed in Category 2 in the September 27, 1985, Federal Register notice (50 FR 39528) of plants under review for threatened or endangered classification due to further questions concerning vulnerability and threats to the small populations. Category 2 includes those taxa for which there is some evidence of vulnerability, but for which there are not enough data to support listing proposals at this time. A March 1989 report addressing the Arizona willow found on the White Mountain Apache Indian Reservation and a species' status report for the Apache-Sitgreaves National Forest, dated April 1988, prompted the placement of Arizona willow in Category 1 in the February 21, 1990, Federal Register notice (55 FR 8184) of plants under review for threatened or endangered classification. The studies by Galeano-Popp (1988) and Granfelt (1989) presented additional information on vulnerability and threats faced by this species which supported moving the species from Category 2 to Category 1.

All plants included in the comprehensive plant notices are treated as under petition. Section 4(b)(3)(B) of the Act, as amended in 1982, requires the Secretary to make certain findings on pending petitions within 12 months of their receipt. Section 2(b)(1) of the 1982 amendments further required that all petitions pending on October 13, 1982, be treated as having been newly submitted on that date. Because the plants in the December 15, 1980, Federal Register notice, including Arizona willow, were treated as under petition, they were considered to be newly petitioned on October 13, 1982. In 1983, 1984, 1985, 1986, 1987, 1988, 1989, and 1990, the Service found that the petitioned listing of Arizona willow was warranted but precluded by other listing actions of higher priority and that additional data on vulnerability and threats were still being gathered. This proposal constitutes the final 1-year finding as required by the 1982 amendments to the Act.

Summary of Factors Affecting the Species

Section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act set forth the procedures for adding species to the Federal lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section

4(a)(1). These factors and their application to *Salix arizonica* Dorn (Arizona willow) are as follows:

A. The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range

Historic and current livestock grazing in the high elevation riparian meadows on the Forest has contributed to habitat degradation. Livestock have had less of a recent effect on Reservation riparian areas because no livestock grazing has occurred there for a number of years. Livestock overuse of riparian meadows affects the habitat through hydrologic changes, soil compaction, erosion, bank instability, and siltation. Repeated habitat overuse by cattle results in reduced plant vigor and reproductive success, shifts in relative abundance of plant species, and localized loss of plant species. The adverse effects of livestock on the habitat are believed to be the most important factor affecting the populations on the Forest (Galeano-Popp 1988).

Erosion and siltation may adversely affect Arizona willow through their influence on plant vigor and reproductive success (Medina 1990; Tom Subirge, Apache-Sitgreaves National Forest, pers. comm., 1991). The primary source of siltation in Arizona willow habitat on the Forest is probably habitat disturbance from livestock. Another cause of erosion and siltation in Arizona willow habitat is timber harvesting and related activities such as road building in the upper watersheds on the Reservation.

The construction of reservoirs and stock ponds has resulted in the loss of Arizona willow habitat and probably plants, and may have contributed to increased wildlife use within Arizona willow habitat areas. Many of the dams were constructed prior to the description of this species or the knowledge of its limited distribution.

Recreation has adversely affected Arizona willow habitat and populations. Although part of one recreation site, which was subject to heavy use, has been closed to camping since 1980, compacted soils, relatively poor understory composition, and widespread accelerated streambank losses characterize the area. Arizona willow populations within this disturbed area are the least dense on the Forest (Galeano-Popp 1988). Construction of the Sunrise Ski resort on the Reservation also caused the loss of plants and habitat. Degradation of Arizona willow habitat by off-road vehicle users is a potential recreational threat. Riparian habitats are vulnerable to vehicle damage, which can cause

disrupted streamflow, accelerated sedimentation rates, bank instability, and soil compaction.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

None known.

C. Disease or Predation

Arizona willow on both the Forest and the Reservation is infected by a rust identified as *Melampsora* spp. (Gilbertson, University of Arizona, *in litt.*, 1989). The alternate hosts for the rust are apparently *Abies* spp. (fir) and *Ribes* spp. (gooseberry). Evidence of direct or indirect damage from rust can be seen in dead material of previously large plants. While infection levels vary with locality, one entire half-mile stretch of Arizona willow on the Reservation was defoliated by a rust infection (Galeano-Popp 1988).

Resistance to the rust varies as indicated by the proximity of healthy plants to heavily infected plants. *Melampsora* spp. occur on other willow species in Arizona but do not appear to be virulent pathogens associated with high mortality. However, the impacts of grazing could reduce the vigor of otherwise healthy Arizona willow plants making them more prone to infection. The plants, then weakened by both grazing and disease, are more vulnerable to dying from other environmental factors (e.g. frost) (Galeano-Popp 1988).

Arizona willow is eaten by livestock, elk (*Cervus canadensis*), and perhaps small mammals. While it is difficult to determine the proportional use by livestock, elk, and other wildlife, approximately 85 percent of the carrying capacity of the Forest is allocated to livestock (Galeano-Popp 1988). Initial observations of sites that differ in livestock use indicate that livestock grazing is detrimental to Arizona willow (Galeano-Popp 1988). Lower plant densities and decreased plant height are correlated with areas of high livestock use.

D. The inadequacy of existing regulatory mechanisms

Forest Service policy requires a permit to collect Arizona willow on the Forest (USDA, Forest Service 1986). The Arizona Native Plant Law only requires a permit for collecting highly safeguarded plants (Arizona Revised Statutes chapter 7, title 3, article 1). However, overuse from collecting is not presently considered a threat to Arizona willow and these permit requirements do not protect populations from habitat degradation and loss.

E. Other natural or manmade factors affecting its continued existence

Beaver (*Caster canadensis*) dam construction results in flooding of riparian areas. This flooding can inundate and kill local willow populations and remove suitable habitat (Granfelt, *in litt.*, 1991). This is a localized threat because most Arizona willow habitat appears unsuitable for beaver occupation (Galeano-Popp 1988).

Elk damage other willow species in the area by trampling and by rubbing their antlers and bodies against the plants. No data are available to assess the degree of physical damage by elk to Arizona willow.

Populations may also be limited by other natural factors. Some populations have so few plants remaining (as low as one) they may no longer be viable. In addition, competition with other willow species, or conversely, loss of cover provided by other riparian plants may contribute to the decline of the species.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species in determining to propose this rule. Based on this evaluation, the preferred action is to list *Salix arizonica* as endangered. A combination of factors contribute to the decision to propose this species as endangered. Arizona willow plants tend to be sparsely distributed within a small range. Within this small area, threats are numerous, complex, and not easily identified or resolved. Some threats, such as the rust, may not be resolvable. The small range, sparse distribution, degraded habitat, threats due to natural causes and the difficulty of conflict resolution have contributed to the decision to propose this species as endangered rather than threatened. Threatened status would not accurately reflect the precarious status of this species. Critical habitat is being proposed for the reasons stated below.

Critical Habitat

Critical habitat, as defined by section 3(5)(A) of the Act means:

(i) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection and;

(ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are

essential for the conservation of the species.

Section 4(a)(3) of the Act requires that critical habitat be designated to the maximum extent prudent and determinable concurrently with the determination that a species is endangered or threatened. Critical habitat is being proposed for *Salix arizonica* to include high altitude riparian areas along streams or cienegas on the northern, eastern, and southern slopes of the White Mountains hill mass, Apache County, east-central Arizona. The following areas are proposed as critical habitat:

(1) Approximately 5.6 km (3.5 miles) of Becker Creek and associated tributaries.

(2) Approximately 1.6 km (1 mile) of an unnamed tributary entering Snake Creek from the east in the SE¼ Section 14, T7N R28E.

(3) Approximately 1.8 km (1.1 miles) of Snake Creek.

(4) Approximately 2.9 km (1.8 miles) of Ord Creek, including the reach flowing through Smith Cienega.

(5) Hall Creek upstream approximately 5.3 km (3.3 miles) from the high water mark of the White Mountain Reservoir.

(6) Approximately 7.3 km (4.5 miles) of the West Fork of the Little Colorado River and associated tributaries.

(7) Approximately 13.9 km (8.6 miles) of the East Fork of Little Colorado River and tributaries, including the South Fork of the East Fork of the Little Colorado River.

(8) Purcell Cienega, 65 hectares (160 acres).

(9) Approximately 4.2 km (2.6 miles) of Thompson Creek, including Hall Cienega.

(10) Approximately 4.5 km (2.9 miles) of the West Fork of the Black River between Stinky Creek and Thompson Creek.

(11) Approximately 5.0 km (3.1 miles) of Stinky Creek, between the West Fork of the Black River and the Apache-Sitgreaves National Forest boundary.

(12) Reservation Creek upstream approximately 0.8 km (0.4 mile) from Reservation Lake.

(13) Reservation Creek downstream approximately 3.5 km (2.2 miles) from Reservation Lake, including Deep Cienega.

(14) Approximately 4.2 km (2.6 miles) of Pacheta Creek, including Upper Pacheta Cienega.

(15) Hurricane Creek approximately 2.3 km (1.4 miles) upstream from the normal high water mark of Hurricane Lake.

(16) Approximately 1.0 km (0.6 mile) of an unnamed tributary of Reservation Creek.

Sites numbered 1 through 4, 8, and 12 through 16 are on the White Mountain Fort Apache Indian Reservation. Sites numbered 6, 7, and 11 are on the Apache-Sitgreaves National Forest. Sites numbered 5 and 10 are on the Apache-Sitgreaves National Forest and private land. Site number 9 is on the White Mountain Fort Apache Indian Reservation, Apache-Sitgreaves National Forest and private land. The legal descriptions of specific locations of critical habitat areas are given below under the Proposed Regulations Promulgation section of this proposed rule.

A total of approximately 68 km (40 miles) of stream and 65 hectares (160 acres) of critical habitat is proposed. The areas described were chosen for critical habitat designation because they contain Arizona willow plants. All reaches also contain some unoccupied habitat needed to maintain ecosystem integrity or to support larger Arizona willow populations as the species expands during recovery. A number of separate, protected, healthy populations of Arizona willow are needed to protect the species from extinction if floods cause the loss of one or several populations. Protection of this proposed critical habitat will ensure that sufficient quantity and quality of habitat exists to prevent this species from becoming extinct throughout all or a significant portion of its range.

Constituent elements for all areas of critical habitat except Purcell Cienega include areas that contain the amount and timing of perennial, clear, clean, unpolluted surface and subsurface water flow sufficient to promote vigorous growth and reproduction of Arizona willow. The constituent elements include the riparian ecosystem within 200 years of the center of the stream drainage bottom (measured perpendicularly to the channel) except where (a) tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*). Constituent elements for Purcell Cienega include all areas within the boundaries of the quarter-sections described above that contain the amount and timing of perennial, clear, clean, unpolluted surface and subsurface water flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem except where the following habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

Section 4(b)(8) requires, for any proposed or final regulation that designates critical habitat, a brief description and evaluation of those activities (public or private) that may adversely modify such habitat or may be affected by such designation. Such activities may include road maintenance or construction, timber harvesting, water diversion or impoundment, groundwater pumping, any other activity that may alter the quality or quantity of surface or subsurface water flow, development of recreational facilities near occupied or recovery habitat, and overstocking or other mismanagement of livestock or elk.

Section 4(b)(2) of the Act requires the Service to consider economic and other impacts of designating a particular area as critical habitat. The Service will consider the critical habitat designation in light of all additional relevant information obtained before making a decision on whether to issue a final rule.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with the States. The protection required of Federal agencies and the prohibitions against certain activities involving listed plants are discussed, in part, below.

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) requires Federal agencies to confer informally with the Service on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical

habitat, the responsible Federal agency must enter into formal consultation with the Service.

The Act and its implementing regulations found at 50 CFR 17.61, 17.62, and 17.63 for endangered species set forth a series of general prohibitions and exceptions that apply to all endangered plants. All trade prohibitions of section 9(a)(2) of the Act, implemented by 50 CFR 17.61, apply. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to import or export, transport in interstate or foreign commerce in the course of a commercial activity, sell or offer for sale this species in interstate or foreign commerce, or to remove and reduce to possession the species from areas under Federal jurisdiction. In addition, for listed plants, the 1988 amendments (Pub. L. 100-478) to the Act prohibit the malicious damage or destruction on Federal lands and the removal, cutting, digging up, or damaging or destroying endangered plants in knowing violation of any State law or regulation, including State criminal trespass law. Certain exceptions apply to agents of the Service and State conservation agencies. The Act and 50 CFR 17.62 and 17.63 also provide for the issuance of permits to carry out otherwise prohibited activities involving endangered species under certain circumstances.

It is anticipated that few trade permits would ever be sought or issued because the species is not common in cultivation or in the wild. Requests for copies of the regulations on plants and inquiries regarding them may be addressed to the Office of Management Authority, U.S. Fish and Wildlife Service, P.O. Box 3507, Arlington, Virginia 22201 (703/358-2104).

Public Comments Solicited

The Service intends that any final action resulting from this proposal will be as accurate and as effective as possible. Therefore, comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this proposed rule are hereby solicited.

Comments are particularly sought concerning:

- (1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to this species;
- (2) The location of any additional populations of this species and the reasons why any habitat should or should not be determined to be critical habitat as provided by section 4 of the Act;
- (3) Additional information concerning the range, distribution, and population size of this species; and
- (4) Current or planned activities in the subject area and their possible impacts on this species.
- (5) Any foreseeable economic and other impacts resulting from the proposed designation of critical habitat.

Final promulgation of the regulations on this species will take into consideration the comments and any additional information received by the Service, and such communications may lead to a final regulation that differs from this proposal.

The Endangered Species Act provides for a public hearing on this proposal, if requested. Requests must be received within 45 days of the date of publication of the proposal. Such requests must be made in writing and addressed to Sam F. Spiller, Field Supervisor, U.S. Fish and Wildlife Service, Ecological Services Field Office (refer to ADDRESSES section).

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the Federal Register on October 25, 1983 (48 FR 49244).

References Cited

- Dorn, R.D. 1975. A systematic study of *Salix* section *Cordatae* in North America. Canadian Journal of Botany. 53:1491-1522.

Galeano-Popp, R.C. 1988. *Salix arizonica* Dorn. on the Apache-Sitgreaves National Forest: inventory and habitat study. Apache-Sitgreaves National Forest, Springerville, Arizona. 47 pp.

Granfelt, C. 1989. Arizona willow (*Salix arizonica* Dorn) populations on the Fort Apache Indian Reservation, Arizona. White Mountain Apache Game and Fish Department, White River, Arizona. 37 pp.

Medina, A.L. 1990. Study plan: Autecology of Arizona willow in the Mount Baldy region of east central Arizona. U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station, Tempe, Arizona. 28 pp.

Phillips, B.G., N. Bnan, J. Mazzone, and L.T. Green III. 1982. Status report for *Salix arizonica*. Fish and Wildlife Service, Albuquerque, New Mexico. 12 pp.

USDA. Forest Service. 1986. Forest Service Manual, title 2800—wildlife, fish, and sensitive plant habitat management.

Authors

The primary authors of this proposed rule are William Austin and Sue Rutman (see ADDRESSES).

List of Subjects in 50 CFR Part 17

Endangered and threatened species. Exports, Imports, Reporting and recordkeeping requirements. Transportation.

Proposed Regulations Promulgation

PART 17—[AMENDED]

Accordingly, it is hereby proposed to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

1. The authority citation for Part 17 continues to read as follows:

Authority: 16 U.S.C. 1361-1407; 16 U.S.C. 1531-1544; 16 U.S.C. 4201-4245; Pub. L. 99-625, 100 Stat. 3500; unless otherwise noted.

2. It is proposed to amend § 17.12(h) for plants by adding the following species and by adding a new family "Salicaceae—Willow family," in alphabetical order, to the List of Endangered and Threatened Plants:

§ 17.12 Endangered and threatened plants.

• • • • •
(h) • • •

Species		Historic range	Status	When listed	Critical habitat	Special rules
Scientific name	Common name					
Salicaceae—Willow family:						
<i>Salix arizonica</i>	arizona willow	U.S.C. (AZ)	E		17.96(a)	NA

3. It is further proposed to amend § 17.96(a) by adding critical habitat of *Salix arizonica* (Arizona willow) in the same alphabetical order as the species occurs in § 17.12(h).

§ 17.96 Critical habitat—plants.

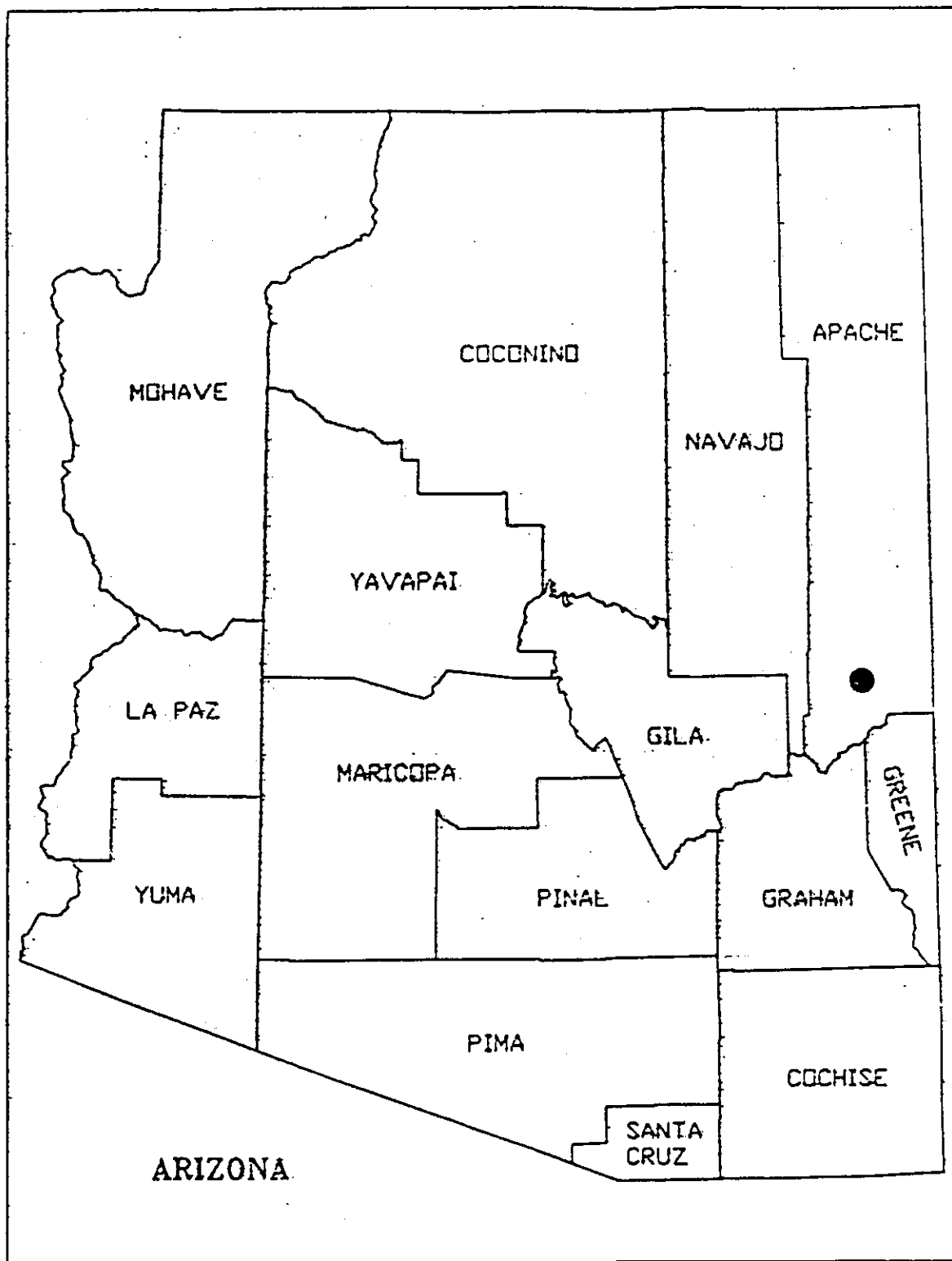
(a) * * *

Family—Salicaceae.

Salix arizonica (Arizona willow).

Arizona: Maps 2-7 are subset maps located in the general area indicated on map 1

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1. *Apache County*: Becker Creek upstream from its confluence with Snake Creek to the western boundary of the E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 28, T7N R26E, including unnamed tributaries in the following sections of T7N R26E: the NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 22, the E $\frac{1}{2}$ NE $\frac{1}{4}$ Section 26, and the W $\frac{1}{2}$ NW $\frac{1}{4}$ Section 25. The boundaries include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

2. *Apache County*: An unnamed tributary entering Snake Creek from the east of SE $\frac{1}{4}$ Section 14 in T7N R26E, upstream to the southern boundary of the NW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 13, T7N R26E. The boundaries include areas with the

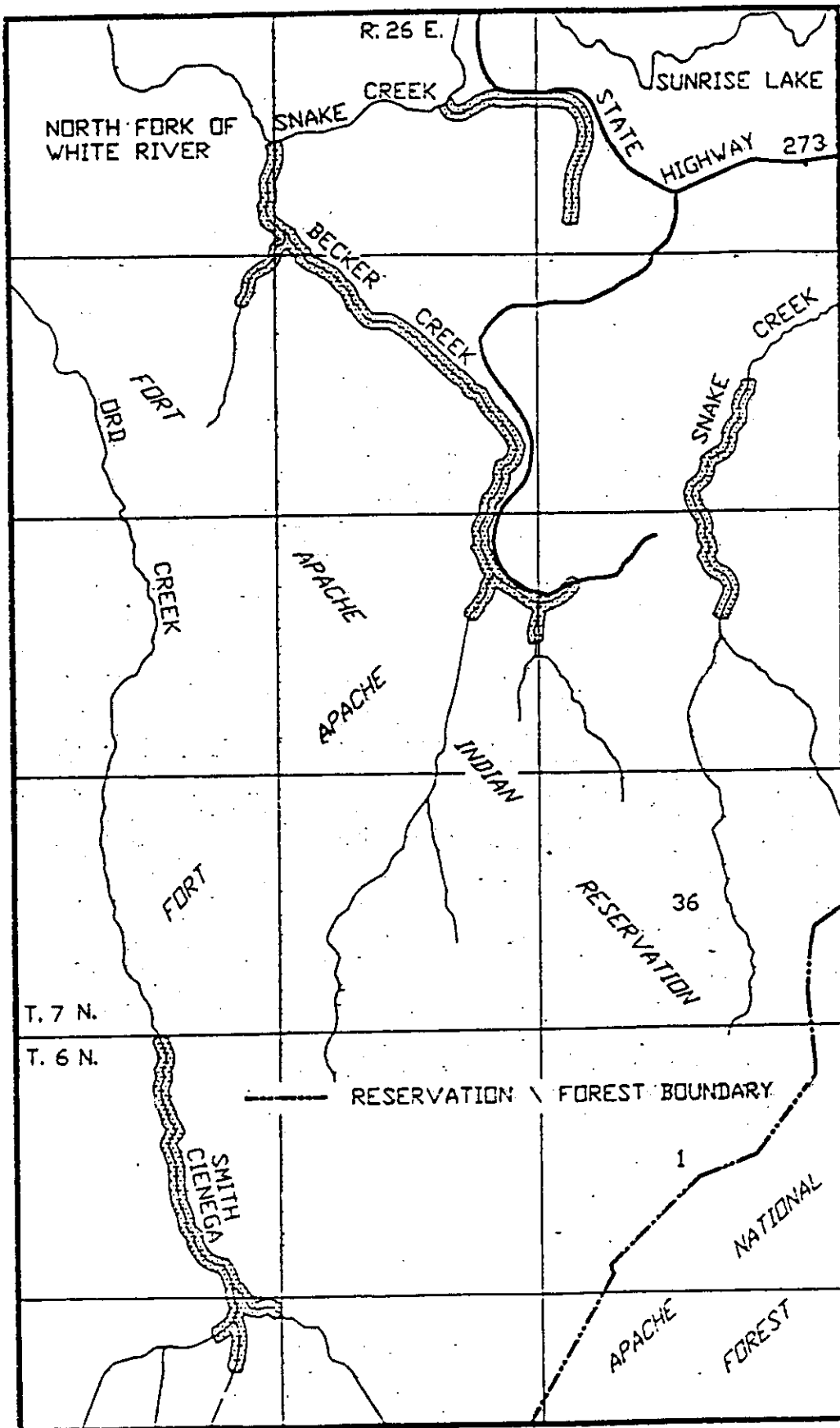
amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

3. *Apache County*: Snake Creek from the northern boundary of the S $\frac{1}{2}$ Section 24, T7N R26E, upstream to the southern boundary of the N $\frac{1}{2}$ Section 25, T7N R26E. The boundaries include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following habitat conditions are met: (a) Tree

canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

4. *Apache County*: Ord Creek including the section of the stream flowing through Section 3, T6N R26E (including the reach flowing through Smith Cienega), and including Ord Creek and unnamed tributaries in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ Section 10, T6N R26E. The boundaries include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

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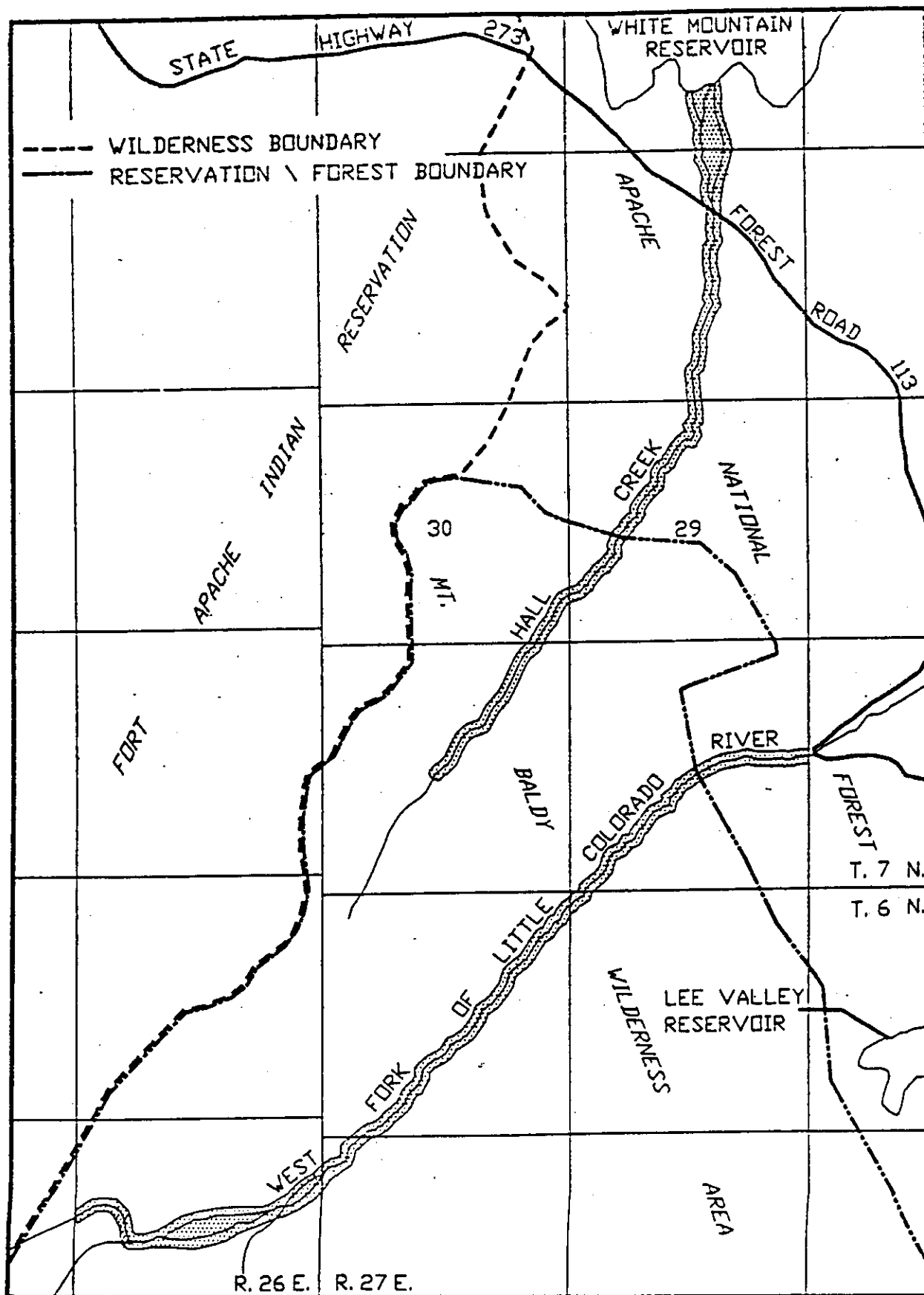
5. *Apache County*: Hall Creek upstream from the high water mark of the White Mountain Reservoir, to the southern boundary of the N½ Section 31, T7N R27E. The boundaries include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following

habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

6. *Apache County*: West Fork of Little Colorado River and tributaries in T7N R27E, Sections 32 and 33; T6N R27E, Sections 5, 6, and 7; and T6N R26E, Section 12. The boundaries include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to

promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

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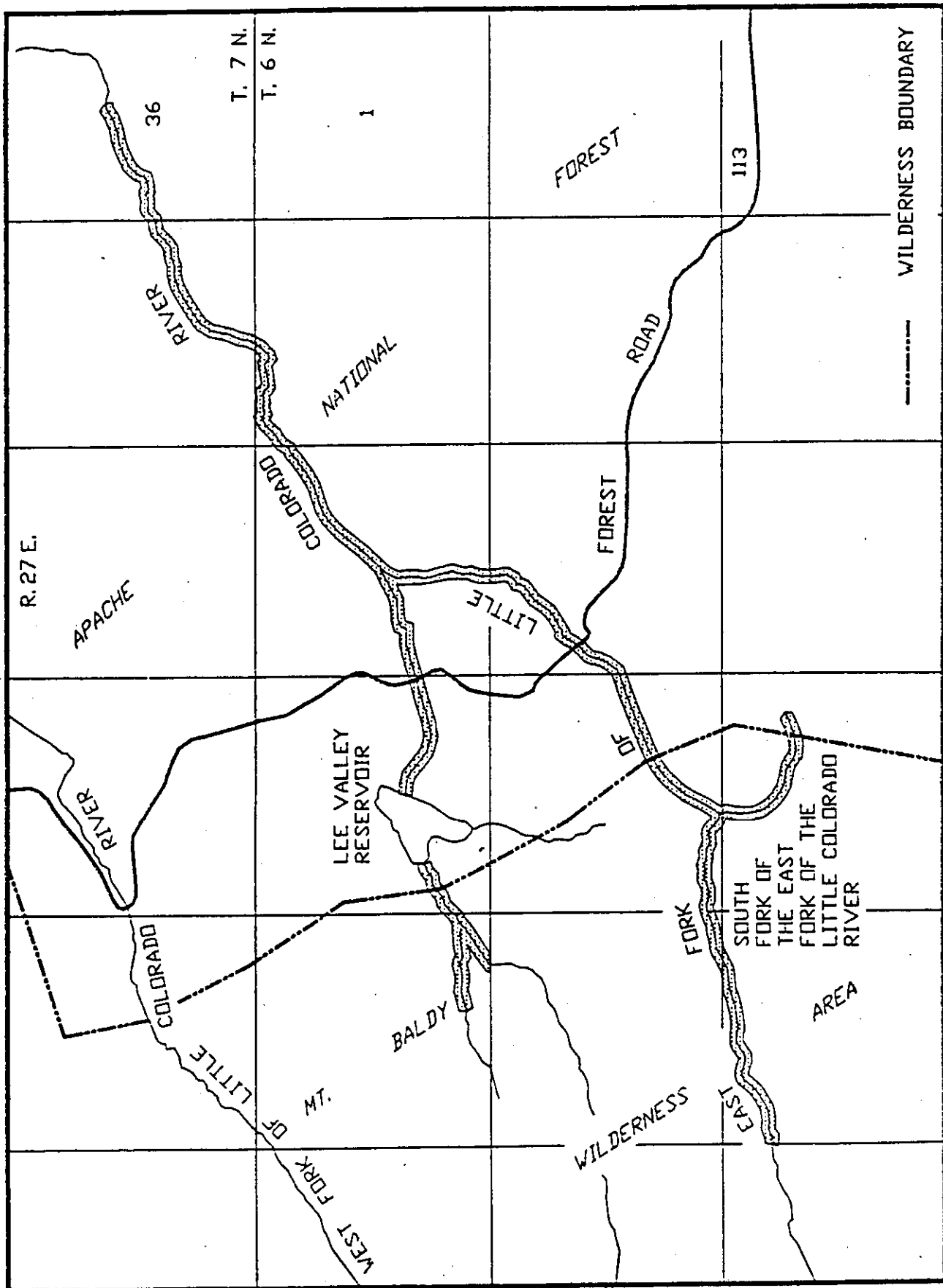


7. *Apache County:* East Fork of Little Colorado River upstream from the eastern boundary of the W $\frac{1}{2}$ Section 36, T7N R27E, to the western boundary of T6N R27E, Section 17. Tributaries included in this stream complex include downstream from Lee Valley Reservoir to the East Fork of the Little Colorado River (T6N R27E, Sections 3 and 4), the South Fork of the East Fork of the Little Colorado River (T6N R27E, Sections 9 and 16), the tributary between Coulter

Reservoir and Lee Valley Reservoir (T6N R27E, Section 12), the tributary that forms the northwest arm of Lee Valley Reservoir from the high water mark of the reservoir upstream to include two forks within Section 3, T6N R27E. The boundaries include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian

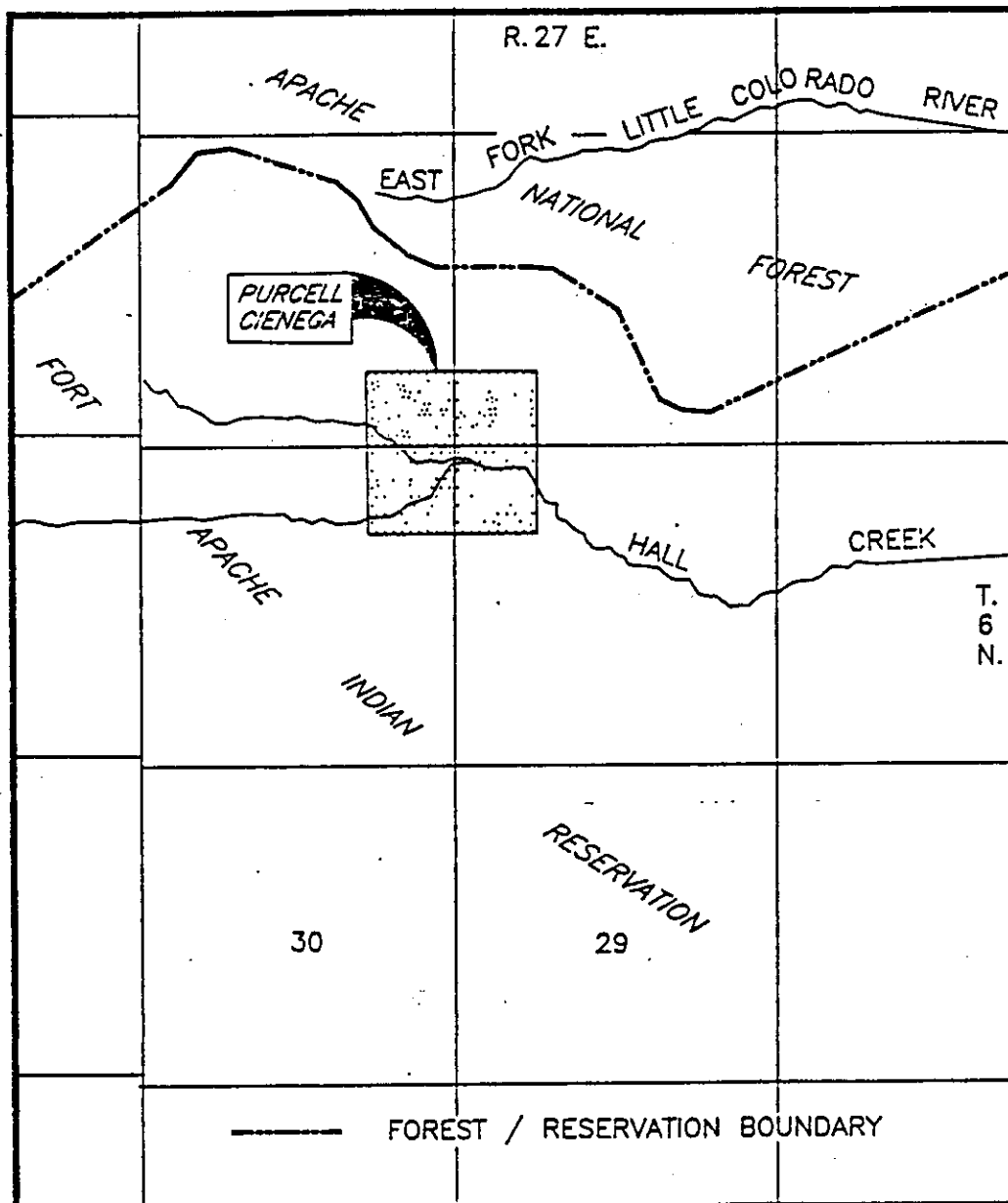
ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

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8. *Apache County*: Purcell Cienega, which occurs along a reach of the West Fork of the Black River in T6N R27E in the following Sections: NE¼NE¼ Section 19, SE¼SE¼ Section 18, SW¼SW¼ Section 17, and NW¼NW¼ Section 20. The boundaries include those areas of the quarter-sections described above that contain the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem except where the following habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

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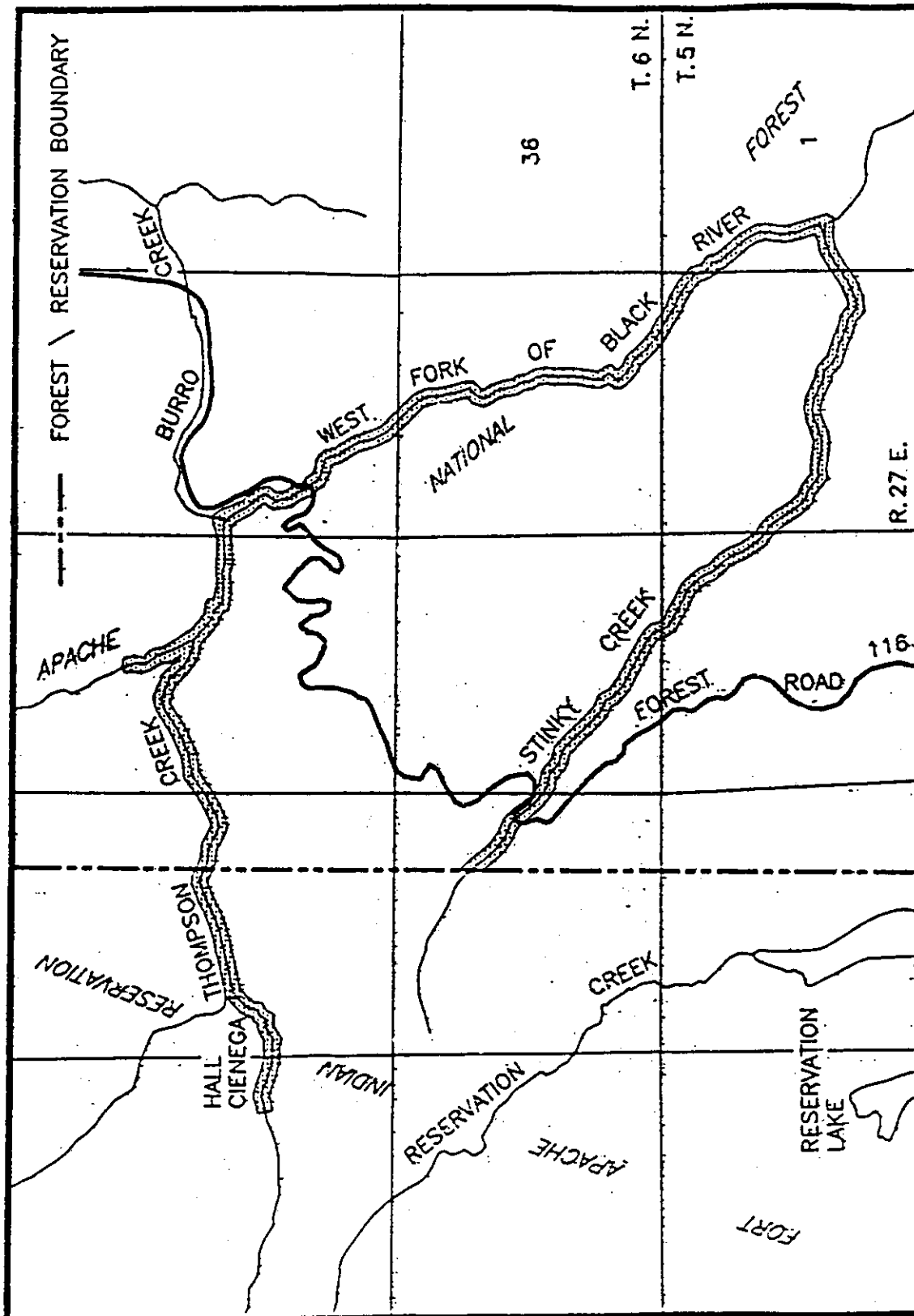


9. *Apache County*: Thompson Creek from the confluence of Thompson Creek and the West Fork of the Black River (T6N R27E, Section 27) upstream to the western boundary of the E 1/4 T6N R27E, Section 29. The boundaries include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following habitat conditions are met: (a) tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

10. *Apache County*: West Fork of the Black River, upstream from its confluence with Stinky Creek (T5N R27E, Section 1) to the confluence of Thompson Creek and the West Fork (T6N R27E, Section 27). The boundaries include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

11. *Apache County*: Stinky Creek from its confluence with the West Fork of the Black River (T5N R27E, Section 1) upstream to the boundary of the Apache-Sitgreaves National Forest (T6N R27E, Section 33). The boundaries include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

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12. *Apache County*: Reservation Creek from the normal high water mark of Reservation Lake upstream to the northern boundary of the NE¼ Section 4, T5N R27E. The boundaries include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

13. *Apache County*: Reservation Creek downstream from the outlet from Reservation Lake (T5N R27E, Section 7) to the southern boundary of T5N R27E, Section 20. The boundaries include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following

habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

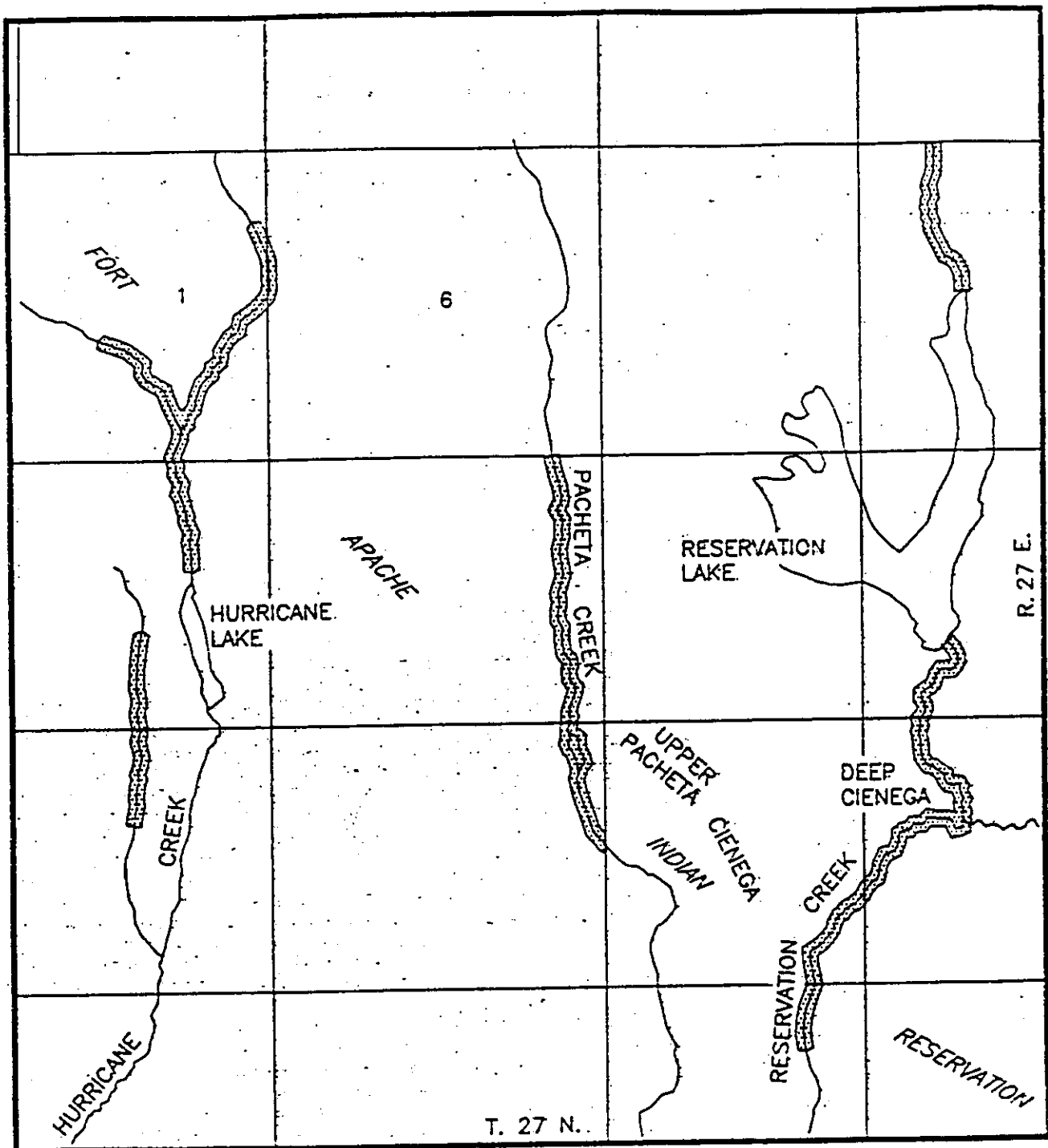
14. *Apache County*: Pacheta Creek in T5N R27E, Sections 7 and 8. The boundaries include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

15. *Apache County*: Hurricane Creek upstream from the normal high water mark of Hurricane Lake to the northern boundary of the S¼ Section 1, T5N R26E, including the unnamed tributary in that subsection. The boundaries include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth

and reproduction of Arizona willow and the riparian ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

16. *Apache County*: A reach of an unnamed tributary of Reservation Creek, including the NE¼NW¼ Section 13, T5N R26E, upstream through the SE¼SW¼ Section 12, T5N R26E. The boundaries include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem within 200 yards on either side of the center of the drainage bottom (measured perpendicularly to the channel), except where the following habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

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Constituent elements for all areas of critical habitat except Purcell Cienega include areas with the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the riparian ecosystem within 200 yards of the center of the drainage bottom (measured perpendicularly to the channel) to incorporate the broader areas with plants, except where the following habitat conditions are met: (a)

Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*). Constituent elements for Purcell Cienega include all areas within the boundaries of the quarter-sections described above that contain the amount and timing of perennial, clear, clean, unpolluted surface and subsurface flow sufficient to promote vigorous growth and reproduction of Arizona willow and the

riparian ecosystem except where the following habitat conditions are met: (a) Tree canopy cover exceeds 25 percent or (b) greater than 25 percent cover is contributed by Arizona fescue (*Festuca arizonica*) and Mountain muhly (*Muhlenbergia montana*).

Dated: October 14, 1992.

Richard N. Smith,

Acting Director, Fish and Wildlife Service.

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